## REMARKS

The present application was filed on September 22, 1999 with claims 1-11. In the outstanding Office Action, the Examiner has: (i) rejected claims 1-3, 5-7, 10 and 11 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,081,783 to Divine et al. (hereinafter "Divine"); (ii) rejected claims 4 and 8 under 35 U.S.C. §103(a) as being unpatentable over Divine in view of U.S. Patent No. 5,555,420 to Sarangdhar et al. (hereinafter "Sarangdhar"); and (iii) rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Divine in view of U.S. Patent No. 5,682,554 to Harrell (hereinafter "Harrell").

In this response, Applicants: (i) traverse the §102(e) and §103(a) rejections; and (ii) add new claims 12-14 for consideration. Applicants respectfully request withdrawal of the §102(e) and §103(a) rejections and reconsideration of the present application in view of the following remarks.

Regarding the drawings, Applicants submit herewith formal drawings that are believed to overcome all informalities raised in Form PTO-948.

Regarding the §102(e) rejections of claims 1-3, 5-7, 10 and 11, Applicants respectfully assert that Divine fails to teach or suggest all of the limitations of such claims, for at least the following reasons.

The present invention, for example, as recited in independent claims 1, recites a method of processing work items in a data processing system, comprising: (i) generating an interrupt in response to receipt of a work item in the system; (ii) servicing the generated interrupt to schedule a task for later processing of the work item, without re-enabling the interrupt; (iii) subsequently executing the task to process the work item; and (iv) speculatively scheduling a further task for processing of any work items that are subsequently received in the system. Independent claims 5 and 10 recite other aspects of the invention comprising similar limitations.

Advantageously, as explained in the present specification at page 3, line 9, through page 6, line 18, the present invention is contrasted with prior systems in which, when an interrupt is serviced and a task scheduled for later execution, the interrupt is enabled/unmasked. Thus, in prior systems, the receipt of further work items will cause the generation of further interrupts. In the present invention, the interrupt is not enabled when the interrupt is serviced and therefore further work items will not generate interrupts. Further, when the task executes, it processes the work items after which a speculative task is scheduled and added to the task queue. The task is speculative in the sense that

when it is generated there are no work items on the queue to be processed. However, it is anticipated that further work items will have been added by the time the speculative task reaches the head of the task queue and is executed.

Further, in a preferred embodiment, when the speculatively scheduled task is executed to process any work items received by the system and it is determined that there are no work items, the interrupt is enabled. Thus, when there is high system utilization, the interrupt mechanism is replaced with a polling mechanism involving a continuous series of speculatively scheduled tasks. However, when the system or device utilization decreases, e.g., when there are no work items when the speculatively scheduled task is processed, then the system reverts to interrupts.

On the other hand, Divine discloses an audio decoder including a first digital signal processor (DSP) for performing a first set of operations on a received audio data stream and a second DSP for performing a second set of operations on data passed from the first DSP (see column 2, lines 27-31).

The Office Action generally points to column 16, line 38, through column 17, line 20 of Divine for support in rejecting claims 1-3, 5-7, 10 and 11. However, neither this cited portion of Divine, nor any other portion of Divine, teaches or suggests all the limitations of the subject claims.

The portion of Divine cited in the Office Action provides an explanation of the interrupts that are used in accordance with each of the DSPs disclosed by Divine. Short interrupts are disclosed as occurring if the instruction at the interrupt vector location is anything other than a jump instruction. Long interrupts occur if the instruction at the interrupt vector location is a jump instruction. When the jump occurs, an IEN bit is cleared to disable further interrupts. Also, the contents of a status and shadow status registers 704 swap. The status and shadow registers 704 support context switching during interrupt service routines (column 14, lines 38-45). When a return-from-interrupt (RETI) instruction is executed, the IEN bit is set, the status and shadow status registers are again swapped, and program control switches back to normal.

Thus, it is clear that the above-described interrupt arrangement of Divine fails to teach or suggest all of the claim limitations of independent claims 1, 5 and 10. For example, Divine does not "service the generated interrupt to schedule a task for later processing of the work item, without re-enabling the interrupt," as recited in claims 1, 5 and 10. While Divine discloses that, when a jump occurs, further interrupts are disabled, Divine discloses nothing about servicing a generated interrupt to schedule a task for later processing of a work item, without re-enabling the interrupt.

Further, Divine does not "speculatively schedule a further task for processing of any work items that are subsequently received in the system," as recited in claims 1, 5 and 10. There is no disclosure or suggestion whatsoever in Divine of performing such a speculative scheduling operation. This is because Divine does not address the problem that the invention does of providing mechanisms for handling both low and high system utilization. As mentioned above, in accordance with the invention, the generated interrupt is not enabled when the interrupt is serviced and therefore further work items will not generate interrupts. Thus, when the task executes, it processes the work items after which a speculative task is scheduled and added to the task queue. It is anticipated that further work items will have been added by the time the speculative task reaches the head of the task queue and is executed. Thus, in a preferred embodiment, when there is high system utilization, the interrupt mechanism is replaced with a polling mechanism involving a series of speculatively scheduled tasks. However, when system utilization decreases, e.g., when there are no work items when the speculatively scheduled task is processed, then the system reverts to interrupts. Divine fails to teach or suggest any such arrangement.

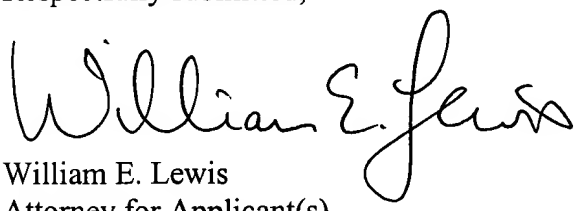
For at least the reasons given above, Applicants respectfully request withdrawal of the §102(e) rejections of independent claims 1, 5 and 10. Further, not only due to their respective dependence on independent claims 1, 5 and 10 but also because such claims recite patentable subject matter in their own right, Applicants respectfully request withdrawal of the §102(e) rejections of dependent claims 2, 3, 7, and 11.

Regarding the §103(a) rejections of claims 4, 8 and 9, since Sarangdhar and Harrell fail to remedy any of the deficiencies of Divine, Applicants respectfully request withdrawal of the §103(a) rejections of such claims. However, it is also respectfully asserted that such claims recite patentable subject matter in their own right.

Applicants present new claims 12-14 for consideration. Such new claims are believed to be patentable over the cited references for at least the same reasons presented above.

In view of the above, Applicants believe that claims 1-14 are in condition for allowance and, therefore, respectfully request favorable reconsideration.

Respectfully submitted,



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William E. Lewis
Attorney for Applicant(s)
Reg. No. 39,274
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-2946